UCRL-JC-122290 Abs

Estimation of Thyroid Doses Received by the Population of Belarus as a Result of the Chernobyl Accident*

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Abstract. Within weeks of the Chernobyl accident, about 300,000 measurements of human thyroidal 131I content were conducted in the more contaminated territories of the Republic of Belarus. Results of these and other measurements form the basis of thyroid-dose reconstruction for residents of Belarus. Preliminary estimates of thyroid doses have been divided into three classes:

Class 1 ("measured" doses). Individual doses are estimated directly from the measured thyroidal 131I content of the person considered, plus information on lifestyle and dietary habits. Such estimates are available for about 130,000 individuals from the contaminated areas of Gomel and Mogilev Oblasts.

Class 2 ("passport" doses). For every settlement with a sufficient number of residents with "measured" doses, individual-thyroid-dose distributions are determined for several age groups and levels of milk consumption. This action has been called the "passportization" of the settlement. A population of about 2.5 million people resides in the "passportized" settlements.

Class 3 ("inferred" doses). For any settlement where the number of residents with "measured" doses is small or equal to zero, individual thyroid doses are derived from the relationship obtained between the mean-adult-thyroid dose and the deposition density of 131I or 137Cs in settlements with "passport" doses presenting characteristics similar to those of the settlement considered. This method can be applied to the remainder of the population (about 7.5 million people).

An approximate estimate of the collective thyroid dose for the residents of Belarus is presented. Illustrative results of individual-thyroid dose and associated uncertainty are discussed for rural settlements and urban areas.

* Portions of this work were performed at the Lawrence Livermore National Laboratory under the auspices of the Office of International Health Studies; Assistant Secretary for Environment, Safety and Health; US Department of Energy; under contract W-7405-Eng-48.